WHAT IS CLAIMED IS:

1. A method for dynamically configuring a topology of a communication network, the communication network including a plurality of nodes for providing access to the communication network, the method being performed at each node in the communication network and comprising the steps of:

(a) determining the locations of selected nodes for establishing communication therewith, said selected nodes being selected from the plurality of nodes in accordance with predetermined network topology parameters;

(b) providing a directed beam of electromagnetic radiation for each of said selected nodes for carrying a respective information signal thereon;

(c) directing said directed beam toward a corresponding one of said selected nodes to establish a respective communication link therewith;

(d) determining if said respective communication links established between the plurality of nodes in the communication network provide a closed signal path amongst the plurality of nodes;

(e) repeating the method at step (a) if said closed signal path is not found in step (d);

(f) evaluating communication quality of each of said

communication links against a predetermined link quality parameter;

(g) redirecting said directed beam corresponding to a node for which said communication quality fails to meet said predetermined link quality parameter toward another of said plurality of nodes to establish a new communication link therewith; and

(h) repeating the method at step (d).

2. The method for dynamically configuring a topology of a communication network as recited in Claim 1, wherein said network topology parameters include distance to nearest node, said selected nodes being nearest ones of the plurality of nodes.

3. The method for dynamically configuring a topology of a communication network as recited in Claim 2, wherein said distance to nearest node is determined by electromagnetic broadcast data.

4. The method for dynamically configuring a topology of a communication network as recited in Claim 3, wherein said electromagnetic broadcast data is transmitted by a radio-frequency transmitter at each of the plurality of nodes.

5. The method for dynamically configuring a topology of a communication network as recited in Claim 3, wherein said electromagnetic broadcast data is transmitted an optical transmitter at each of the plurality of nodes

6. The method for dynamically configuring a topology of a communication network as recited in Claim 1, wherein said directed beam provided for each selected node is independently steerable, each with respect to the other.

7. The method for dynamically configuring a topology of a communication network as recited in Claim 1, wherein said electromagnetic radiation is of optical wavelength.

8. The method for dynamically configuring a topology of a communication network as recited in Claim 1, wherein step (c) includes the steps of:

(i) providing a beacon signal source at each of the plurality of nodes;

(ii) maximizing received power of a beacon signal from said beacon signal source to direct said directed beam at said corresponding selected node; and

(iii) maximizing received power of said information signal for establishing said respective communication link.

9. The method for dynamically configuring a topology of a communication network as recited in Claim 8, wherein said received beacon signal power maximization of step (ii) includes the step of pointing said directed beam of said corresponding selected node with a coarse beam pointing mechanism along a direction at which said received power of said beacon signal is maximized.

10. The method for dynamically configuring a topology of a communication network as recited in Claim 8, wherein said received information signal power maximization of step (iii) includes the step of pointing said directed beam of said corresponding selected node with a fine beam pointing mechanism along a direction at which said received power of said information signal is maximized.

11. The method for dynamically configuring a topology of a communication network as recited in Claim 1, wherein step (c) includes the steps of:

(i) scanning said directed beam corresponding to said communication link with said selected node to locate a position where received power of said scan data signal is maximized; and

(ii) directing said directed beam at said position where said received power of said scan data signal is maximized.

12. The method for dynamically configuring a topology of a communication network as recited in Claim 11, wherein said scanning of step (ii) is a conical scan.

13. The method for dynamically configuring a topology of a communication network as recited in Claim 1, wherein step (c) includes the steps of:

(i) transmitting a location code over said directed beam corresponding to communication link with selected node;

(ii) receiving a location code from said corresponding selected node;

(iii) directing said directed beam in accordance with said location code received in step (ii).

14. The method for dynamically configuring a topology of a communication network as recited in Claim 1, wherein step (c) includes the steps of:

(i) transmitting a beam pointing direction code over said directed beam corresponding to said communication link with said selected node;

(ii) receiving a beam pointing direction code from said corresponding selected node;

(iii) directing said directed beam in accordance with said beam pointing direction code received in step (ii); and

(iv) repeating the method at step (ii) until said directed beam is directed at said selected node.

15. The method for dynamically configuring a topology of a communication network as recited in Claim 1, wherein said link quality parameter is a bit error rate of said information signal.

16. The method for dynamically configuring a topology of a communication network as recited in Claim 15 further including the step of maximizing received power of said information signal if said bit error rate exceeds a predetermined bit error rate threshold.

17. The method for dynamically configuring a topology of a communication network as recited in Claim 16, whereby said received power maximization is performed by altering beam divergence of said directed beam of said corresponding selected node.

18. The method for dynamically configuring a topology of a communication network as recited in Claim 1 further including the step of providing a secondary data channel for conveying secondary data to the plurality of nodes.

19. The method for dynamically configuring a topology of a communication network as recited in Claim 18, wherein said locations of said selected nodes is determined in step (a) by receiving location information corresponding to the plurality of nodes as said secondary data over said secondary data channel.

20. The method for dynamically configuring a topology of a communication network as recited in Claim 18, wherein said information signal is conveyed as secondary data over said secondary data channel.

21. The method for dynamically configuring a topology of a communication network as recited in Claim 20, whereby said information signal is conveyed over said secondary data channel only if said information signal could not be conveyed via said communication link over said respective directed beam.

22. A method for configuring a topology of a communication network comprising the steps of:

(a) providing the network with a plurality of nodes for affording access thereto, each of said plurality of nodes including a set of primary data channel transceivers and a set of secondary data channel transceivers;

(b) locating positions of said plurality of nodes with respect to each node in the network and storing said positions in a position table at said each node;

(c) determining link states of said plurality of nodes with respect to said each node in the network and storing said link states in a link state table at said each node;

(d) at said each node in the network, selecting a current set of selected nodes from said plurality of nodes with which a corresponding communication link is to be established in accordance with information stored in said position table and said link state table and storing current selected node information in a connection table;

(e) determining if said current selected node information indicates that said current set of selected nodes are interconnected by a closed signal path;

(f) directing each of said set of primary data channel transceivers of said each node toward a corresponding one of said current set of selected nodes in accordance with said current selected node information stored in said connection table;

(g) establishing said communication link over a primary data channel between said primary data channel transceiver of said each node and a corresponding primary data channel transceiver at each of said current set of selected nodes, said primary data channel carrying an information signal thereon;

(h) at said each node in the network, monitoring said communication link corresponding to each of said current set of selected nodes for communication quality with respect to a predetermined link quality parameter;

(i) adjusting transmitted power at said each node so as to maximize received power at each of said current set of selected nodes if said communication link monitoring of step (g) indicates said communication quality fails to meet said predetermined link quality parameter;

(j) at said each node, if said transmitted power adjustment step (h) fails to improve said communication quality to meet said predetermined link

quality parameter, selecting a new set of selected nodes from said plurality of nodes with which a new communication link is to be established in accordance with information stored in said position table and said link state table and storing new selected node information in said connection table at said each node;

(k) determining if said selected node information indicates that said set of selected nodes are interconnected by a closed signal path and, if so, designating said new selected node information as said current selected node information;

(l) redirecting one of said set of primary data channel transceivers corresponding to one of said current selected nodes for which said communication link fails to meet said predetermined link quality parameter toward one of said new set of selected nodes;

(m) establishing said communication link over a primary data channel between each of said primary data channel transceivers of said each node and a corresponding primary data channel transceiver at each of said new set of selected nodes and designating said new set of selected nodes as said current set of selected nodes; and

(n) repeating the method at step (h) .

23. The method for configuring a topology of a communication network as recited in Claim 22 further including the step of providing a directed beam of electromagnetic radiation at each of said primary data transceivers for conveying said information signal thereon.

24. The method for configuring a topology of a communication network as recited in Claim 23, whereby said transmitted power is adjusted by altering beam divergence of said directed beam of said primary data transceiver corresponding to each of said current set of selected nodes.

25. The method for configuring a topology of a communication network as recited in Claim 22, wherein said electromagnetic radiation of said primary data channel is of optical wavelength.

26. The method for dynamically configuring a topology of a communication network as recited in Claim 22, wherein said link quality parameter is a bit error rate of said information signal.

27. The method for dynamically configuring a topology of a communication network as recited in Claim 26 further including the step of maximizing received power of said information signal if said bit error rate exceeds a predetermined bit error rate threshold.

28. The method for dynamically configuring a topology of a communication network as recited in Claim 27, whereby said transmitted power is adjusted by altering beam divergence of said directed beam of said primary data transceiver corresponding to each of said current set of selected nodes for which said bit error rate exceeds said predetermined bit error rate threshold.

29. The method for dynamically configuring a topology of a communication network as recited in Claim 22, whereby said information signal is conveyed via said secondary data channel transceivers if said transmitted power maximization failed to establish said communication link of said communication link quality sufficient to meet said link quality parameter.

30. The method for dynamically configuring a topology of a communication network as recited in Claim 29, wherein said secondary data channel transceivers are radio frequency broadcast transceivers.

31. The method for dynamically configuring a topology of a communication network as recited in Claim 29, wherein said secondary data channel transceivers are optical frequency broadcast transceivers.

32. The method for dynamically configuring a topology of a communication network as recited in Claim 22, wherein said set of secondary data channel transceivers is a set of a single secondary channel transceiver.